REMARKS

Reconsideration is requested in view of the above amendments and the following remarks. The title of the application has been revised editorially. Support for revisions in the title can be found in, e.g., Fig. 5, among other places. Claim 1 has been revised. Support for the revisions can be found at, e.g., Figs. 1 and 5 and the paragraph bridging pages 1 and 2 of the specification and page 6, lines 20-28 of the specification, among other places. Claims 1-18 remain pending in the application.

Objections to the Specification

The specification is objected to as not descriptive. The specification has been revised editorially. The title has been revised to AN OVERLAPPING COMMAND AT ONE STAGE SUBMITTING METHOD OF DYNAMIC CYCLE PIPELINE. Support for revisions in the title can be found in, e.g., Fig. 5, where, in one embodiment, Commands A and G are overlapped at stages 1, 2 and 3. Withdrawal of the objection is respectfully requested.

Claim Rejections – 35 USC § 103

Claims 1, 4-10 and 15-18 are rejected under 35 USC § 103(a) as being unpatentable over Computer Organization and Design (hereinafter referred to as "Hennessy") in view of Kawasaki et al. (US 6,343,357). Applicants respectfully traverse this rejection.

Claim 1 requires that an old command exit a pipeline at a predctermined stage without passing through stages subsequent to the predetermined stage in the pipeline. Claim 1 further requires judging whether there is command relevance between a new command to be inserted and an old command to exit after receiving an exiting signal, and if not, submitting the new command to the pipeline when the old command is in the last cycle of the pipeline.

Conventionally, as shown in Fig. 1, when Command A exits after Stage 3 of the pipeline and other commands, e.g., Commands B, C, D, . . . need to exit after Stage 6 of the pipeline, bubbles have to be added in the pipeline, as shown in Fig. 1.

In one embodiment of the present invention, as shown in Fig. 5, the method includes judging whether there is command relevance between a new Command G and the old Command A after receiving an exiting signal, and if not, submitting the new Command G to the pipeline when the old Command A is in the last cycle of the pipeline. As clearly shown in Fig. 5, Commands A and G are overlapped in Stages 1, 2 and 3 of the pipeline. As a result, the present method helps remove the bubbles in the pipeline and improve the pipeline efficiency, and thus helps increase the speed of command processing (see, e.g., Fig. 5, among other places).

Hennessy fails to teach or suggest judging whether there is command relevance between a new command to be inserted and an old command to exit after receiving an exiting signal, and if not, submitting the new command to a pipeline when the old command is in the last cycle of the pipeline, as required by claim 1. Instead, Hennessy discusses inserting at least one bubble into a pipeline when there is a conflict between an old instruction and a new instruction (see Hennessy, pages 489-91), and, as a result, bubbles may appear in the pipeline. That is, the focus of Hennessy is on inserting bubbles, rather than removing bubbles.

Kawasaki et al. do not remedy the deficiencies of Hennessy. Kawasaki et al. merely discuss that when an internal bus is shared between a data transfer operation and an instruction fetch operation, a pipe control is executed to prefer the instruction fetch operation over the data transfer operation (see Kawasaki et al., col.4, lines 1-7). In fact, in Kawasaki, even if there is no relevance between the data transfer operation and the instruction fetch operation, the instruction fetch operation would still be delayed. Nowhere do Kawasaki et al. teach or suggest overlapping command submitting as claimed in claim 1.

Moreover, there is no teachings or suggestions of modifying Hennessey to include judging whether there is command relevance between a new command to be inserted and an old command to exit after receiving an exiting signal, and if not, submitting the new command to a pipeline when the old command is in the last cycle of the pipeline, as required by claim 1, much less of any reasons to expect that the advantages enjoyed by the invention of claim 1, e.g., submitting the new command to a pipeline when the old

command is in the last cycle of the pipeline when there is no relevance, could be achieved.

For at least these reasons, claim 1 is patentable over Hennessy in view of Kawasaki et al. Claims 4-10 and 15-18 depend ultimately from claim 1 and are patentable along with claim 1 and need not be separately distinguished at this time. Applicants are not conceding the relevance of the rejection to the remaining features of the rejected claims.

Claims 2-3 and 10-14 are rejected under 35 USC § 103(a) as being unpatentable over Hennessy/Kawasaki et al. in view of Vaglica et al. (US 5,084,814). Applicants respectfully traverse this rejection. Claims 2-3 and 10-14 depend ultimately from claim 1 and are patentable over Hennessy/Kawasaki et al. in view of Vaglica et al. for at least the same reasons discussed above regarding claims 1, 4-10 and 15-18. Vaglica et al. do not remedy the deficiencies of Hennessy/Kawasaki et al. Applicants are not conceding the relevance of the rejection to the remaining features of the rejected claim.

In view of the above, favorable reconsideration in the form of a notice of allowance is respectfully requested. Any questions regarding this communication can be directed to the undersigned attorney, Rong Yang, Limited Recognition No. L0279, at (612) 455-3816.

Respectfully submitted,

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